

3.3-P17. Improved detection and parameter estimation for regional S-phases using the fully 3-component ARCES array

In September 2014 all 25 sites of the ARCES seismic array in Norway were upgraded to 3-component stations, making it the first fully 3-C IMS array. S-phases are of paramount importance for detecting and locating seismic events at regional distances and it is important that these phases are both detected and attributed accurate slowness estimates. The estimated apparent velocity and backazimuth identify the detection and provide phase association algorithms with information necessary to form a high quality seismic event hypothesis. Previously, ARCES had 3-C stations at four sites only. While these 3-component seismometers were highly beneficial for detecting regional S-phases, it was often more reliable to perform f-k analysis on the 25 vertical sensors rather than on the rotated horizontal traces. We compare systematically the SNR on transverse and vertical beams for S-phases from regional events recorded since the upgrade. The horizontal traces provide both increased SNR and coherence, improving the stability of f-k analysis. The improved S-phase coherence on the transverse rotations provides the basis for superior S-phase detection capability using F-detectors and other coherence-based algorithms. The upgrade of other IMS seismic arrays to fully 3-C arrays would likely improve global event detection and location capability significantly.

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